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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/506,418	03/30/2005	Ya-Jane Wang	ARK007-157/02157	8357
24118 7590 11/29/2007 HEAD, JOHNSON & KACHIGIAN 228 W 17TH PLACE TULSA, OK 74119			EXAMINER ASINOVSKY, OLGA	
			ART UNIT	PAPER NUMBER
			1796	
			MAIL DATE	DELIVERY MODE
			11/29/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/506,418

Applicant(s)

WANG ET AL.

Examiner

Olga Asinovsky

Art Unit

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Applicants' miscellaneous letter of 09/19/2007 is noted.

The telephone call was made on November 20, 2007 with request to correct the office action mailed on June 22, 2007 since the reference Patent 6,054,510 to Willett et al has been cited in the paragraph 4 at page 3, but the reference has not been discussed.

The applicants' request is persuasive.

New consideration is cited below.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3 and 8-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Jane et al U.S. Patent 5,115,000.

Jane discloses a composition comprising a granular starch, oxidized polyethylene and polyethylene which has not been modified, column 2, lines 4-7 and 27. Jane discloses the claimed synthetic polymer and starch blend wherein the composition comprises the claimed ingredients. Oxidized polyethylene has carboxy group on the oxidized polyethylene. The oxidized polyethylene is a compatibilizer agent between the starch and polyethylene, column 2, lines 32-37. The carboxy groups on the oxidized polyethylene form ester bonds with the hydroxyl groups on the starch, column 2, lines

36-38. The starch is present in the preferred amount of from 6 to 15 % by weight, column 3, line 28. The oxidized polyethylene can be present in the amount of from 6% to 15% by weight, column 3, line 46. The ratio of the amount of starch to oxidized polyethylene is within the range of 1:1, column 3, lines 50-54. Therefore, the starch is present in the amount of from 6 to 15% by weight. The amount of the ingredients is readable in the present claims. Jane discloses a process for synthesizing a biodegradable plastic composition by blending a starchy material, oxidized polyethylene and unmodified polyethylene under temperature ranging between 145 to 165 C in the double screw extrude, column 4, lines 5-11. The claimed invention is fully anticipated by the disclosure in Jane invention.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jane et al U.S. Patent 5,115,000 as applied to claims 1-3 and 8-9 above, and further in view of Dehennau et al U.S. Patent 5,510,401, and further in view of Kozma et al U.S. Patent 6,242,503 as evidence for forming a covalent bond between the polymer and the maleic anhydride.

Jane does not disclose that a grafting compound is covalently attached to a polymer (for claim 4), wherein said grafting compound is maleic anhydride (for the present claim 5).

Dehennau discloses a biodegradable film produced from a composition comprising a starch, polyethylene modified by grafting maleic anhydride and a non-modified polyethylene, column 6, lines 20-35, for the present claim 1. The maleic anhydride grafted on to polyethylene is readable for being claimed compatibilizer in the present claims 1, 4, 5, 6. The starch includes a wheat starch and/or potato starch, column 3, lines 27-28. A process for producing a biodegradable film includes step of mixing the ingredients in a co-rotating twin screw extruder under 160 C., column 4, line 31.

Dehennau does not disclose the formation a covalent bond between the polymer and maleic anhydride grafted to said polymer.

Kozma discloses the maleated polyethylene, wherein maleic anhydride-grafting is covalently bonding one or more maleic anhydride groups to the original polymer chains, column 4, lines 23-29 and column 7, lines 35-37.

Jane and Dehennau disclose the claimed polymer and starch blend for producing a biodegradable synthetic polymer composition. Both references belong to the similar utility for producing a biodegradable polymer.

Kozma is cited as evidence for creating covalent bond between the polyethylene and grafted maleic anhydride.

it would have been obvious to one of ordinary skill in the art at the time of the invention to substitute the carboxylic groups containing oxidized polyethylene in Jane invention with a grafted maleated anhydride modified polyethylene in Dehennau invention because oxidized polyethylene in Jane invention and maleated polyethylene in Dehennau belong to the analogous organic acid functionalized polyethylene, and such modification will not change the chemical reaction with starch component; and in light of the teaching in Kozma invention, the covalent bond between the polyethylene and grafted maleic anhydride is also created in Dehennau invention since the same polyethylene and the same grafted maleic anhydride are readable in Dehennau and Kozma invention in absences on any unexpected evidence.

5. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dehennau et al U.S. Patent 5,510,401 in view of Kozma et al U.S. Patent 6,242,503, and further in view of Chinnsawamy et al U.S. Patent 5,496,895.

Dehennau invention and Kozma are considered above.

Dehennau does disclose starch, graft maleated polyethylene and polyethylene for the present claim 1.

Dehennau does not disclose that a grafting compound= maleic anhydride is covalently attached to said polymer in the present claim 4.

Dehennau discloses maleic anhydride grafted polyethylene.

Kozma is cited as evidence for creating covalent bond between the polyethylene and grafted maleic anhydride.

It would have been obvious to one of ordinary skill in the art to use the known technique for creating covalent bond between the polyethylene and grafted maleic anhydride in Kozma invention for the analogous polyethylene grafted with maleic anhydride in Dehennau since the same results would be expected, and thereby obtain the claimed requirement wherein the maleic anhydride is covalently attached to the polyethylene.

Dehennau does not disclose that the compatibilizer and the granular starch become covalently bound in the present claim 10, wherein the compatibilizer comprises a grafting compound and polymer.

Chinnaswamy discloses biodegradable polymer composition comprising a starch and non-biodegradable plastic, wherein the non-biodegradable polymer is treated by adding an oxidizing agent. The non-biodegradable polymer includes any alkyne or alkene chain including polyethylene, polypropylene, polystyrene, column 3, lines 33-38, for the present claims 6 and 10. The oxidizing agent includes (meth)acrylic acid, column 3, lines 46 and 54. The treatment (by adding an oxidizing agent under heat and pressure) creates reactive groups such as aldehyde or hydroxyl groups on the non-biodegradable polymers. The starch and the treated non-biodegradable plastic covalently bound to each other, claim 1 at column 8. The compatibilizer in claim 10 is maleic anhydride

grafted polymer referring to the present claims 12 and 13. Chinnaswamy does disclose that starch and the treated non-biodegradable polymer are covalently bound.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the known method for creating covalent bond between the maleic anhydride grafted polyethylene and starch in Chinnaswamy invention for the analogous process for producing a biodegradable film comprising polyethylene grafted with maleic anhydride and starch in Dehennau invention for obtaining the adequate results, and thereby obtain the claimed requirement wherein the compatibilizer and the starch are covalently bound.

6. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dehennau et al U.S. Patent 5,510,401 in view of Papazoglou U.S. Patent 5,216,075.

Dehennau has been discussed in the paragraphs 4 and 5 above. Dehennau does disclose starch, graft maleated polyethylene and polyethylene for the present claim 1. Dehennau does not disclose the claimed compatibilizer that is maleic anhydride grafted poly(styrene-ethylene-butylene-styrene) in the present claim 18.

Papazoglou discloses maleated block copolymer such as functionalized styrene-ethylene/1-butene-styrene (S-E/B-S) rubber, column 7, lines 43-50. The maleated (S-E/B-S) block copolymer is commercially available.

It would have been obvious to one of ordinary skill in the art to substitute the grafted maleic anhydride polyethylene in Dehennau invention with maleated block copolymer (S-E/B-S) in Papazoglou invention as potential options because maleated polypropylene in Dehennau and maleated block copolymer in Papazoglou work equally well to create a chemical reaction with starch with reasonable expectation of success.

In light of the new consideration and new prior art this action is not final.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Olga Asinovsky whose telephone number is 571-272-1066. The examiner can normally be reached on 9:00 to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Application/Control Number:
10/506,418
Art Unit: 1796

Page 9

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C.A.

November 25, 2007

Olga Asinovsky
Examiner
Art Unit 1796



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